

AMENDMENTS TO THE CLAIMS:

This listing of the claims will replace all prior listings and versions of claims in the application:

1. (currently amended) A method for detecting a target nucleic acid, comprising:
 - a) generating a cleavage structure that is cleavable by Mja FEN-1 endonuclease, wherein said cleavage structure comprises:
 - i. said target nucleic acid; and
 - ii. an oligonucleotide hybridized to said target nucleic acid to form a duplex and a single stranded 5' nucleic acid arm;
 - b) cleaving said cleavage structure with a purified thermostable FEN-1 endonuclease, wherein said thermostable FEN-1 endonuclease is active at temperatures above 55°C to release said single stranded 5' nucleic acid arm; and
 - c) detecting the cleavage of said cleavage structure to detect said target nucleic acid

wherein a plurality of cleavage structures are formed on a single copy of said target nucleic acid.

2-3 (cancelled).

4. (previously presented) The method of Claim 1, wherein said plurality of cleavage structures are formed and cleaved under isothermal conditions.

5. (previously presented) The method of Claim 1, wherein said single stranded 5' nucleic acid arm comprises a region that is complementary to said target nucleic acid.

6-9 (cancelled)

10. (original) The method of Claim 1, wherein said target nucleic acid comprises a nucleic acid isolated from a biological sample.

11. (original) The method of Claim 10, wherein said biological sample comprises an infectious disease organism.

12. (original) The method of Claim 1, wherein said target nucleic acid comprises DNA.

13. (original) The method of Claim 1, wherein said target nucleic acid comprises RNA.

14. (original) The method of Claim 1, wherein said target nucleic acid comprises a synthetic nucleic acid molecule.

15. (original) The method of Claim 14, wherein said synthetic nucleic acid molecule is generated in a polymerase chain reaction.

16. (original) The method of Claim 1, wherein at least one nucleic acid molecule in said cleavage structure comprises a nucleotide analog.

17. (original) The method of Claim 16, wherein said non-natural nucleotide comprises a degenerate nucleotide.

18. (previously presented) The method of Claim 1, wherein said cleavage structure comprises said target nucleic acid hybridized to a probe nucleic acid, said probe nucleic acid comprising said single stranded 5' nucleic acid arm.

19. (original) The method of Claim 18, wherein said probe nucleic acid comprises a label.

20. (original) The method of Claim 19, wherein said label comprises a fluorescent label.

21. (currently amended) The method of Claim 18, wherein said cleavage structure further comprises an upstream nucleic acid molecule hybridized to said target nucleic acid, said upstream nucleic acid molecule having a 3' moiety that overlaps with a region of the target nucleic acid that is hybridized to said probe nucleic acid.

22. (original) The method of Claim 21, wherein said 3' moiety of said upstream nucleic acid molecule comprises a nucleotide.

23. (original) The method of Claim 22, wherein said nucleotide is complementary to said target nucleic acid.

24. (original) The method of Claim 22, wherein said 3' moiety of said upstream nucleic acid molecule comprises a 3' terminal nucleotide that is not complementary to said target nucleic acid.

25. (original) The method of Claim 22, wherein said 3' moiety of said upstream nucleic acid molecule consists of a 3' terminal nucleotide that is not complementary to said target nucleic acid.

26. (original) The method of Claim 1, wherein said detecting the cleavage of said cleavage structure comprises detection of fluorescence.

27. (original) The method of Claim 1, wherein said detecting the cleavage of said cleavage structure comprises detection of mass.

28. (original) The method of Claim 1, wherein said detecting the cleavage of said

cleavage structure comprises detection of fluorescence energy transfer.

29. (original) The method of Claim 1, wherein said detecting the cleavage of said cleavage structure comprises detection selected from the group consisting of detection of radioactivity, luminescence, phosphorescence, fluorescence polarization, and charge.

30. (original) The method of Claim 1, wherein said detecting the cleavage of said cleavage structure comprises directly detecting a nucleic acid fragment generated by cleavage of said cleavage structure.

31. (previously presented) The method of Claim 30, wherein said fragment comprises said single stranded 5' nucleic acid arm.

32. (original) The method of Claim 30, wherein said fragment comprises two or more nucleotides.

33. (original) The method of Claim 1, wherein said detecting the cleavage of said cleavage structure comprises indirectly detecting a nucleic acid fragment generated by cleavage of said cleavage structure.

34. (original) The method of Claim 33, wherein said indirectly detecting comprises hybridizing said nucleic acid fragment to a template nucleic acid to form a detection complex.

35. (original) The method of Claim 34, wherein said detection complex is configured to be bound by a protein.

36. (original) The method of Claim 35, wherein said protein is a ligase.

37. (original) The method of Claim 35, wherein said protein is a polymerase.

38. (original) The method of Claim 36, wherein said polymerase is a DNA polymerase.
39. (original) The method of Claim 36, wherein said polymerase is an RNA polymerase.
40. (original) The method of Claim 1, wherein at least one nucleic acid molecule in said cleavage structure is attached to a solid support.
- 41-75 (cancelled)